Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Letter to the Editor

Comments on coronavirus positive patients presenting with stroke-like symptoms

Dear Editor,

We read with interest the short communication entitled "Coronavirus Positive Patients Presenting with Stroke-Like Symptoms",[1] it was a case series on stroke presentation over COVID-19 patients. We are particularly interested on patient 10, the one and only one central retinal artery occlusion (CRAO) case secondary to occlusive thrombus in the internal carotid artery (ICA), who was also highlighted by the authors. CRAO is a blinding ocular emergency, and a harbinger of ischemic cerebrovascular stroke. It is the ocular equivalent of an ischemic stroke.[2] As ophthalmologists in the Hyperbaric Oxygen therapy for central Retinal Artery occlusion (HORA) study,[3] we are gathering global data on the incidence and correlation of CRAO with COVID-19. Our tertiary CRAO referral center has treated 15 acute CRAO cases with hyperbaric oxygen therapy (HBOT) under COVID-19 local outbreak, but there were no cases tested positive for SARS-CoV-2 before or after the CRAO episode, mean follow up period was 5 months.

Ocular manifestation of COVID-19 has long been a hot debate and research topic, and there were only 3 case reports for COVID-19 related CRAO,[4–6] and 1 case of COVID-19 related ophthalmic artery occlusion (OAO),[7] after comprehensive search over PubMed, Medline, EMBASE, Cochrane library and Google Scholar with the terms ["central retinal artery occlusion" OR "CRAO"] AND ["COVID" OR "coronavirus"] as at 16th January 2021. The CRAO case within the case series presented by Alam et al. contributed the 4th case of COVID-19 related CRAO, and attracts HBOT practitioners' attention, because HBOT is useful only for CRAO, but not OAO as in the case described by Dumitrascu et al.[7] In addition, CRAO is indicated for HBOT during the COVID-19 outbreak as directed by the position statement from European Committee for Hyperbaric Medicine.[8]

Alam et al extracted some of the radiological imaging studies and presented them for patient 1, 6, 12, 16 in Figure 1.[1] However, the radiological imaging for the special and interesting case of patient 10 was not available. In Table 1, Alam et al described the stroke pattern for patient 10 was right ICA occlusion, whereas the vascular territory involved was right CRAO. With the basic knowledge on the neck vascular anatomy, where ICA supplies the ophthalmic artery which then supply the central retinal artery; ophthalmologists would suspect an OAO instead of CRAO. Clarification of the difference is essential for treatment implication as HBOT is only effective to CRAO but not OAO.[9]

Murchison et al actually presented a similar case before,[6] which posterior communicating artery filled back the obstructed ICA and thus perfused back the ophthalmic artery. If this was similar in the case from Alam et al, it would establish a new understanding on the thrombotic ICA circulation in COVID-19 patients, particularly alerting ophthalmologists on CRAO prophylaxis under the context of large vessel ischemic stroke among COVID-19 cases. In fact, COVID-19 related OAO (n = 1) is even rarer than CRAO (n=3) purely judged from the number of cases reported. Alam et al could supplement the radiological angiogram findings for patient 10 to further concrete the novel pathology of retinal vascular occlusion on COVID-19 patients.

From our view, the correlation of CRAO and COVID-19 is still of limited evidence despite almost a year of the pandemic. Metabolic diseases such as hypertension, atherosclerosis, diabetes mellitus, obesity etc. are all known risk factors for CRAO, as well as stroke.[10–12] All the published cases on presumed COVID-19 induced CRAO patients processed these risk factors,[1,4–6] with hypertension being the commonest among all. The same pattern was observed in Alam et al case series too. In contrast, large COVID-19 case series did not find CRAO as the ocular manifestations.[13,14] Hypothetically, the generalized hypercoagulability status of systemic COVID-19 infection should cause bilateral involvement, which was not the case observed so far.[1,4–6] These CRAO eyes were most likely coincident on those at risk (metabolic diseases) patients given the prevalence of COVID-19.

Sunny Chi Lik Au, MBChB, MRCSEd, AFCOphthHK,
Callie Ka Li Ko, MBBS, FCOphthHK, FHKAM (Ophthalmology)
Department of Ophthalmology, Pamela Youde Nethersole Eastern Hospital, Hong Kong

Corresponding author.
E-mail address: kilihcua@gmail.com

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